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ABSTRACT

A study investigated children's ability to understand the use of deictic terms in oral and written language. The three deictic categories examined were pronouns (I, you), locatives (this, here), and motion verbs (come, go). Three groups of 24 second grade students completed an oral language task, a written language task, and a picture selection task. Results indicated that written language tasks were more difficult for children than were comparable oral language tasks. Comparisons between the deictic categories showed that some were easier for children to interpret than others. Comparisons between pragmatically different discourse contexts showed that children found it easier to interpret deictic terms when they were participants than when they were merely observers of a conversation. Interpreting deictic terms in written texts that appear to be addressed to the reader was as difficult for children as interpreting deictic terms in written texts representing quoted dialogue. The difficulty children had in interpreting the terms appeared to stem primarily from (1) the necessity of adopting someone else's perspective in particular discourse contexts, (2) the increased processing demands of tasks that require simultaneous attention to more than one variable, and (3) the artificiality of particular kinds of written texts such as those that are given to beginning readers. (Author/FL)

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# COMPREHENSION OF DEICTIC CATEGORIES IN ORAL AND WRITTEN LANGUAGE

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## ABSTRACT

The research issue addressed in this study concerns children's ability to understand the use of deictic terms in oral and written language. Three deictic categories were investigated, pronouns, (e.g., I, you), locatives (e.g. this, here) and motion verbs (e.g., come, go). Three groups of twenty-four second graders performed three types of tasks, an oral language task, a written language task and a picture selection task.

The results indicated that written language tasks were more difficult than comparable oral language tasks. Comparisons between the deictic categories indicated that some deictic categories were easier for children to interpret than others. Comparisons between pragmatically different discourse contexts indicated that children found it easier to interpret deictic terms when they were participants than when they were merely observers of a conversation. Interpreting deictic terms in written texts which appear to be addressed to the reader was as difficult for children as interpreting deictic terms in written texts representing quoted dialogue.

The difficulty children had in interpreting deictic terms appeared to stem primarily from three factors: 1) the necessity of adopting someone else's perspective in particular discourse contexts, 2) the increased processing demands of tasks which require simultaneous attention to more than one variable, and 3) the artificiality of particular kinds of written texts such as those which are given to beginning readers.

The research issue addressed in this study concerns the nature of the development of children's understanding of the deictic system and their ability to employ their knowledge of the system in the process of contextualization across differing conditions of discourse. The term "deixis" is used to refer to the function of those linguistic forms or features which relate utterances to the spatio-temporal co-ordinates of the act of utterance (Lyons, 1977b). The use of deictic devices is determined by the possible relations that may hold between the speaker and the addressee of an utterance, or between the speaker and the event described in his utterance (Fillmore, 1971). Examples of deictic categories follow:

Person-Deixis: pronouns; terms which require knowledge of the speaker or hearer for interpretation.

May I ride your bike?
You have my pencil.

Temporal-Deixis: temporal adverbs, tense, time phrases; terms which require knowledge of the time of the utterance.

I saw the game yesterday (a week ago).
Give it to me now.

Place-Deixis: terms which are dependent on the spatial position of the speaker and/or hearer.

Adverbs:

Put it there.
Put it here.

Demonstrative Adjectives and Pronouns:

I want this little toy.
Give me that.

Deictic Motion Verbs: Motion verbs involve all three components in their meaning: person, place, and time (Fillmore, 1971).

May I come in?
Do you want to go in?

Because deictic devices perform the function of linking utterances to

their spatio-temporal and personal contexts, an understanding of their use is a necessary part of the process of contextualization in comprehension. The operational definition of contextualization adopted here is taken from the point of view of the language decoder. In the present study, contextualization refers to the process of construction of a context (a frame of reference) for the interpretation of text.

Spoken and written language differ in regard to the demands they make in regard to contextualization. First, spoken language typically occurs in a real-world context in the presence of a listener. Written texts, in contrast, require the interpreter to create an "imaginary" context. Second, the encoding of written language is typically separated in time and space from the decoding of the message. Consequently, cues in the context of the situation, which may facilitate the interpretation of speech, are absent when the child confronts a written text. The physical presence of individual participants in most speech events, for example, provides "anchors" which make the distinction between different people's statements and points of view obvious (Rubin, 1978). Written language, on the otherhand, requires the mental representation of imagined individuals in imagined situations for the purpose of adopting a perspective for the interpretation of text. When reading, the child must rely on 1) the information available in the lexical-syntactic-channel, 2) his pragmatic knowledge of how language is used in different contexts or settings, and 3) whatever knowledge he may have of the conventions of written language (e.g., quotation marks), to maintain distinctions between the statements and points of view of the various participants in the speech events portrayed in a text, as well as distinctions between those events and the situation of which the text itself is a part. One would expect that contextualization of written language would be more difficult for young children than contextualization of spoken language in face to face situations.

However, even in face to face situations, children must be able to understand how deictic terms are anchored to the speaker and the time of the utterance in order to interpret them correctly. Although children may have acquired a great deal of understanding of how the deictic system operates from their early language experiences (e.g., face-to-face conversation), their knowledge of the system may still be in a process of development at the time they enter school. Research in the language acquisition literature indicates that mastery of certain deictic categories (i.e., motion verbs) is achieved late in the process of language development (Tanz, 1977; Clark, 1974). In addition, some deictic categories may be more difficult for children to interpret than others if they require more complex contextualization processes. Pronouns refer explicitly to speech roles. Locatives, (e.g. this, that, here and there), on the other hand, are only implicitly anchored to the role of the speaker, while motion verbs have multiple possible points of orientation, and the rules for their applicability are quite complex (Fillmore, 1971).

Use of the deictic system requires the coordination and manipulation of a great deal of information concerning time, location, perspective and the identity and speeech roles of participants in language events. One would expect therefore, that some face to face situations would be more difficult for children if the comprehension task is more cognitively complex. Situations which require the child to adopt the perspective of another for the purpose of interpretation (e.g. overheard conversation) should be more difficult for children than situations which do not.

The purpose of this study was to investigate children's ability to coordinate deictic information in different tasks and discourse contexts. It addresses the general question of whether young children can interpret deictic terms in written language as well as they can in oral language and investi-

gates several factors which appear to contribute to difficulty in interpretation.

More specifically, this study is directed toward an examination of the following research questions: 1) Do young children find it easier to interpret deictic terms in oral language where they have the support of anchors in the situational context than in written language where they do not? 2) Do young children find some deictic categories easier to interpret than others in particular sentence contexts such as imperative constructions. 3) Are some discourse contexts more difficult for children than others? This third research question can be broken down into two parts: a) In oral language, do children find it easier to interpret deictic terms when they are participants than when they are merely observers of a conversation. b) In written language, do children find it easier to interpret deictic terms in texts which appear to be addressed to them than in texts which represent quoted dialogue? The last research question is more general and exploratory in nature. 4) How do children employ their knowledge of deictic terms across differing conditions of discourse?

## Methods

### Subjects

The subjects in this study were 72 children from a school district which serves a predominantly suburban, Caucasian, middle socio-economic status (SES) population in Northern California. The district was selected in order to minimize individual differences in SES, dialect and native language backgrounds among the subjects. Because different languages have different deictic systems and different ways of signaling deictic information, only native speakers were included in the study, in order to avoid the possibility that errors in interpretation resulted from native language differences, and/or problems in translation from one language to another.

Second grade was selected as the appropriate age group for the study because basic decoding skills are usually well established by the end of this year. The data for the study were collected in May.

Subject Selection Procedures

Subjects were drawn from five second grade classrooms in three elementary schools. Since a major objective of the study was to determine whether or not the absence of physical anchors in the situational context would have a decremental effect on children's ability to interpret deictic expressions correctly, potential subjects were screened to ensure that subject's errors on the written language tasks were not the result of an inability to decode the words of the texts. Potential subjects were given a list of words from the texts, and children who exhibited difficulty in decoding were excluded from the study.

Design

Subjects who successfully completed the decoding screening task were randomly assigned to one of three groups. Each of the three groups was tested on different deictic categories in each of three task conditions. Three deictic categories were investigated: pronouns, locatives[1] and motion verbs. The three tasks were an oral language task, a written language task, and a picture-selection task which incorporated written language. The deictic terms tested in the oral and written tasks were possessive pronouns; (my, your, her, his), locatives; (this, that, here, there) and motion verbs (come, go). In the picture task, a wider variety of deictic terms was employed. In addition to the terms above, pronouns such as "we," "they," "you," "he," "she," and other forms of the motion verbs such as "came," "went," "coming," and "going," were tested. The tasks were individually administered in an area separate

[1] Demonstrative adjectives and adverbs were collapsed into one category for testing because they perform similar functions in the tasks designed for the study.

from the child's classroom in the school.

## Materials and Procedures

### Oral Language Task

The oral language task was developed to measure children's ability to interpret deictic terms in different discourse contexts in a face-to-face situation. The groups which were tested on locatives and motion verbs listened to overheard conversation. The group which was tested on pronouns listened to overheard conversation and were also directly addressed.

In the oral language task, the child and two experimenters each held bags or plates. The children were asked to pretend that a penny was in one of the bags, or under one of the plates. The subjects heard imperative sentences spoken by the experimenters such as "Get the penny in my bag," and were asked to determine the possible location of the penny on the basis of their interpretation of the sentence and the deictic term it contained. Male experimenters participated when boys were tested and female experimenters when girls were tested so that distinctions among the pronouns would not be based on gender. Boys were tested on "his," and girls were tested on "her." An adaptation of the task was developed for the distal locatives "that" and "there, in which only two persons held the objects, since the situation would have been ambiguous if all three participants held bags or plates.

The two experimenters alternated turns at saying the sentences, modeling the turn-taking which occurs in ordinary conversation, and which requires the child to shift his point of reference for interpreting deictic terms. A third experimenter, who did not participate in the role playing situation, gave the child initial instructions about the task and questioned the child about the location of the penny after each of the target sentences spoken by the first two experimenters. Errors were determined by the child's response to a question about the location of the penny.

Written Language Task

The written language task was developed to measure children's ability to interpret deictic terms in written texts. In this task, subjects read short texts modeled on the activities in the oral language task. The same target sentences which were used in the oral language task were inserted in written paragraphs. Two types of paragraphs were used. The first type of paragraph incorporated quoted dialogue, and the paragraphs were analogous to those instances in the oral language task where the experimenters addressed each other and the child was an observer. All three deictic categories were tested with this type of text. An example follows:

John, Sam and Bill had a party.
They all sat down at a table.
Everyone had a plate.
A penny was under one of the plates.
"Sam," said Bill.
"Get the penny under(my/your/his) plate."

In the second type of paragraph, the child was addressed directly. The paragraphs were analogous to those instances in the oral language task for the group tested on pronouns where the experimenters directly addressed the child. The hypothetical situation was described as something which would take place in the future. An example follows:

My name is Tina.
I have a friend named Suzie.
You and Suzie and I will sit down at a table.
Everyone will have a bag.
A penny will be in one of the bags.
The penny will be in her bag.

Only pronouns were tested with direct address texts, since deictic uses of the other categories would not have provided enough information for determining the location of the penny.

Errors were determined by the child's response to a question about the location (or potential location) of the penny. There was no time limit

imposed on the production of an answer, and if children wished to reread a paragraph, they were allowed to do so as many times as they wished. The children responded orally, and an experimenter recorded the answer.

The types of written texts used in this study were modeled on the types of texts commonly found in beginning reading series. Quoted dialogue appears frequently, and direct address appears in the initial books of such series. However, in the real world, characters in books do not address the people who are reading about them, and children are seldom addressed in writing by people that they don't know. Although the written direct address texts used in this study are not ecologically valid real world texts, they are parallel to those children frequently encounter in the initial books of beginning reading series (e.g., I can ride. Can you ride too? I can run. Can you run too? I can read. Can you read too? (Smith & Warhaugh, 1975)).

Picture Task

The picture task was developed to investigate young children's ability to employ knowledge of conditions of appropriateness in the interpretation of deictic terms in written texts, i.e., knowledge of contextual variables which determine whether, and to what degree, something is appropriate in relation to the context in which it is used. Included in such knowledge, is knowledge of deictic roles which are grammaticalized in the category of person, and knowledge of space and time as contextual variables which determine the appropriateness of utterances. As Lyons (1977b) points out, utterances may be grammatically and semantically well-formed, but contextually inappropriate with respect to these variables, e.g., the sentence, "We are having a wet winter here in Berkeley this year," produced by someone in New York City in spring.

The picture task required subjects to select one picture (from a set of three) which best depicted a situation indicated by a particular target sen-

tence within a short paragraph. Deictic terms were incorporated in the target sentences. Selection from a set of alternatives allowed an investigation of various conditions for applicability of the deictic terms. A variety of picture sets were developed for each of the deictic categories, pronouns, locatives and motion verbs. Different text themes were developed for each of the different types of picture sets, so that children would not confuse one text and picture set with the next in a series.

In each of the picture sets, contextual variables were manipulated. The error alternatives in each set were incorrect with respect to particular variables, or in some cases, combinations of variables when single variables could not be held constant.

Pronouns

In the picture sets for pronouns, participant roles (e.g. speaker, addressee, and third party) and the descriptive characteristics of a mentioned object were manipulated as variables. In the error alternatives for these picture sets, either the wrong persons portrayed the roles, or the correct roles were portrayed with wrong objects. The pronouns were incorporated in quoted dialogue.

Locatives

In the picture sets for locatives, participant roles and direction of gesture were manipulated as variables. In the error alternatives, either the participant roles were portrayed by the wrong persons, or the direction of gesture was wrong (e.g. far as opposed to near for "this"). The locatives were incorporated in quoted dialogue.

Motion Verbs

Three different types of picture sets were employed with motion verbs. In the first, direction of motion was varied with participant location and direction of address. In the error alternatives for this type of set, either the

direction of motion of the person being talked about was wrong, or the participants were in wrong locations with the speaker addressing the wrong person. The motion verbs were incorporated in statements in quoted dialogue.

In the second type of picture set, direction of address and participant location were manipulate as variables. In the error alternatives, the participants were either in inappropriate locations, or the speaker was addressing the wrong person. The motion verbs were incorporated in imperatives and permission giving statements.

For the third type of picture set, the motion verbs were incorporated in third person narrative statements about the action of a character. In the picture sets, absolute direction of motion (e.g. up or down) and deictic direction of motion (e.g. toward or away from the camera) were manipulated as variables. In the error alternatives, the character was moving in the wrong direction with respect to one of these variables.

## Analysis

As a whole, the research design includes both a quantitative statistical approach and a qualitative descriptive approach.

Planned comparisons under the Dunn method (Marasciulo & McSweeney, 1977) were used to analyze the data from the oral and written tasks for hypotheses generated from the first three questions posed above. The dependent variable in each case is the number of errors in interpretation of deictic terms. The independent variables are the oral and written task conditions and the deictic categories: pronouns, locatives, and motion verbs. Hypotheses were tested in families for the first three research questions, with each family tested at an overall alpha of .05. The fourth research question was more exploratory in nature. A descriptive approach was employed for the analysis of the data for the last research question. The analysis of the data for the first three

research questions will be discussed first.

Scoring Procedure

An oral reading intonation-based method which took into account punctuation related reading errors which affected the speech roles of the characters in the texts was employed in the analysis of the data from quoted dialogue. It was assumed that this reading represented the child's understanding of the text. Reliability data on the coding of intonational readings indicated 95% agreement on independent codings by different individuals on a random sample of 10% of the children's taped oral readings of the quoted dialogue texts.

Research Question 1: Oral vs. Written

The first research question was: Do young children find it easier to interpret deictic terms in oral language where they have the support of anchors in the situational context than in written language where they do not?

In order to examine this question, performance on the oral language task (in those instances where conversation was overheard) was compared with performance on the written language task (in those instances where quoted dialogue texts were read). Each of the three deictic categories was compared separately.[2] In addition, for the groups tested on pronouns, performance on the oral language task (in those instances where the child was addressed) was compared with performance on the written language task (in those instances where direct address texts were read). Planned comparisons were used, splitting the overall Type I error rate of .05 among the four comparisons.

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[2] Since there were different numbers of items depending upon the deictic category being tested, each person's number of errors was weighted by the number of items. A mean error score was obtained for each individual by dividing the number of errors by the number of items. The means reported in the tables for the first three research questions are the group means based on the individuals' mean scores. The means are based on two repetitions of each deictic item. "His" and "her" are treated as one item.

Table 1. Summary of Planned Comparisons between Mean Errors in the Oral Task and the Written Task for the Intonation-based Method of Error Analysis

| Deictic Category | N | Mean | S.D. | t-value |
|---|---|---|---|---|
| Pronouns | | | | |
| Oral (overheard) | 24 | 0.17 | 0.25 | -7.74 * |
| Written (quoted) | 24 | 0.37 | 0.26 | |
| Oral (direct) | 24 | 0.06 | 0.13 | -5.03 * |
| Written (direct) | 24 | 0.39 | 0.29 | |
| Locatives | | | | |
| Oral (overheard) | 24 | 0.19 | 0.23 | -5.69 * |
| Written (quoted) | 24 | 0.57 | 0.23 | |
| Motion Verbs | | | | |
| Oral (overheard) | 24 | 0.55 | 0.35 | -2.53 * |
| Written (quoted) | 24 | 0.77 | 0.24 | |

*$p \leq .0125$

All of the comparisons were significant, and in the predicted directions. Overheard conversation in the oral task produced fewer errors than quoted dialogue in the written task and direct address in the oral task produced fewer errors than direct address in the written task. The results give strong support to the hypothesis that the absence of physical anchors in the situational context has a decremental effect on children's ability to interpret deictic terms correctly.

Research Question 2: Comparisons Between Deictic Categories

The second research question was: Do young children find some deictic categories easier to interpret than others in particular sentence contexts such as imperatives?

In order to examine this question, planned comparisons were made among the deictic categories within the oral language task (on overheard conversa-

tion), and within the written language task (on quoted dialogue), e.g. pronouns vs. locatives, locatives vs. motion verbs, and pronouns vs. motion verbs, splitting the overall alpha Type I error rate of .05 among the six comparisons, so that each test was done at $p < .008$.

It was predicted that within the oral language task, performance would be better on pronouns, followed by locatives, then motion verbs. No predictions were made for the comparisons in the written language task.

Table 2. Mean Errors and Standard Deviations for the Deictic Categories in the Oral Task

| Deictic Category | N | $\bar{X}$ | S.D. |
|---|---|---|---|
| Pronouns | 24 | 0.17 | 0.25 |
| Locatives | 24 | 0.19 | 0.23 |
| Motion Verbs | 24 | 0.55 | 0.35 |

* * * * *

| Comparisons: | t-value |
|---|---|
| Pronouns vs. Locatives | -0.22 |
| Locatives vs. Motion Verbs | -4.27 * |
| Pronouns vs. Motion Verbs | -4.33 * |

* $p \leq .008$

Table 2 gives the mean errors and standard deviations of the groups tested in the oral task. In the oral task, performance on motion verbs was poorest as predicted. However, no significant differences were found between locatives and pronouns.

For the written task, Table 3 gives the mean errors and standard deviations of the groups tested on the different deictic categories.
In the written task, all of the comparisons were statistically significant. The results indicate that locatives are more difficult to process than pronouns, and that motion verbs are more difficult to process than either pronouns or locatives in the written task.

Table 3. Mean Errors and Standard Deviations for the Deictic Categories in the Written Task

| Deictic Category | N | $\bar{X}$ | S.D. |
|---|---|---|---|
| Pronouns | 24 | 0.37 | 0.26 |
| Locatives | 24 | 0.57 | 0.23 |
| Motion Verbs | 24 | 0.77 | 0.24 |

* * * * *

| Comparisons: | t-value |
|---|---|
| Pronouns vs. Locatives | -2.77 * |
| Locatives vs. Motion Verbs | -2.94 * |
| Pronouns vs. Motion Verbs | -5.49 * |

* $p \leq .008$

Research Question 3: Pragmatically Different Discourse Contexts

The third research question had two parts: 1) In oral language, do children find it easier to interpret deictic terms when they are participants than when they are merely observers of a conversation? and 2) In written language, do children find it easier to interpret deictic terms in texts which appear to be addressed to them than in texts which represent quoted dialogue?

In order to examine these questions, planned comparisons were made between performance on overheard conversation and performance on direct address in the oral language task, and between performance on the quoted dialogue and direct address texts used in the written language task. The overall Type I error rate of .05 was split between the two comparisons.

In the oral language task, it was predicted that performance would be lower on overheard conversation than on direct address. No predictions were made for the comparison between direct address and quoted dialogue in the written language task.

Table 4. Summary of Planned Comparisons between Mean Errors by Text Type in the Oral and Written Tasks

| Task Condition | N | $\bar{Y}$ | S.D. | t-value |
|---|---|---|---|---|
| Oral | | | | |
| Direct | 24 | 0.06 | 0.13 | -2.49 * |
| Overheard | | 0.17 | 0.25 | |
| Written | | | | |
| Direct | 24 | 0.39 | 0.29 | 0.27 |
| Quoted | | 0.37 | 0.26 | |

*p < .025

The result of the comparison between overheard conversation and direct address for pronouns in the oral task was significant. In the written task, the mean number of errors for quoted dialogue ($\bar{X}$ = .37) and for direct address ($\bar{X}$ = .39) were nearly identical, and the null hypothesis was not rejected (t = 0.27, p > .025). The results suggest that overheard conversation is more difficult for children than direct address in oral language tasks, but that quoted dialogue may not be more difficult for children than direct address in written language tasks.

Research Question 4: Use of Pragmatic Knowledge

The fourth research question asks how children employ their pragmatic knowledge of deictic terms across differing conditions of discourse. Since the question was exploratory in nature no hypotheses were proposed. Two types of quantitative analysis were used for the fourth research question. The large-sample approximation of the Wilcoxon matched-pair signed-ranks test was used for comparisons between the different deictic items within each deictic category (e.g., my vs. your, come vs. go) and task condition (i.e., oral, written and picture) for the first type of analysis. This nonparametric procedure was adopted because the range of possible scores on each item was 0-2.

In the second type of analysis, errors produced by the children were analyzed for the presence of patterns of response which might indicate that the children were adopting particular strategies for interpreting the deictic terms they encountered. Frequencies of different types of errors provided additional information about the interpretive strategies children were adopting.

In the oral and written tasks, each of the children's responses was coded as either 1) correct, 2) speaker error, 3) addressee error, or 4) third party error, depending upon which individual was wrongly selected by the child.

The children's selections of pictures to match the written texts in the picture task were coded as either correct or as one of two possible types of errors. The possible types of errors differed in the picture sets for the different deictic categories, depending upon the contextual variables which were manipulated in the pictures.

In addition to these quantitative analyses, probe questions were used to acquire information about the interpretive strategies adopted by the children during each of the task conditions of the study. In the oral and written tasks, children were asked probe questions about the last item in the series after they had completed the task. The probe questions took the form of "Why did you think it was in X's bag," or "Why didn't you pick X's bag." In the picture task, children were questioned at systematic intervals, both before they saw the pictures, and after they had selected one. All of the sessions were tape recorded, so that the children's responses to probe questions could be analyzed. A summary of the most important findings follows.

Oral and Written Tasks

Questioning revealed that when children were interpreting overheard

conversation in the oral task and quoted dialogue in the written task, they adoped similar strategies. These strategies resulted in failure or success at different levels of complexity of the task they were being asked to perform. At the lowest level, selection of the addressee as "the one who was told to get it so he must have it," appeared to be a frequently adopted strategy. In the oral task, it appeared that some children were attending to the function of imperatives generally, in which the implied subject is the addressee, rather than to the function of the deictic item which was realized in the surface structure of the sentence. In the written task, some children appeared to treat the action as completed. When children successfully interpreted their task as one requiring them to figure out from whom the addressee had to get the penny, they frequently failed to attend to the contrastive senses of the diectic elements in the sentences. In the case of the pronouns, this apeared as a failure to apply the contrasts among "my," "your," and "his/her." In the case of the locatives, this apeared as a failure to apply the contrast between the proximal and distal senses of "this" vs. "that." In the case of the motion verbs, this appeared as a failure to apply the contrastive meanings of "come" vs. "go," in the sense of motion toward or away from the speaker.

Results from the signed-ranks tests indicated that some deictic terms within particular categories were more difficult for children to interpret than others in certain tasks and discourse contexts. Although no significant differences were found between the mean ranks of the locatives in either the oral or the written tasks, significant differences were found between the motion verbs in overheard conversation in the oral task. More errors were made on "go" than on "come" ($Z=2.98$, $p < .05$). In order to interpret "go" correctly, the child not only had to attend to who was speaking and who was being addressed in order to figure out from whom the addressee had to get the penny, but he/she also had to eliminate these two as possibilities. The

results suggest that interpreting "go" was a cognitively more complex task for the children than interpreting "come," in the context of the imperative sentences used in the task. These results parallel those found by Clark (1974). In the written task, although the mean for "go" was higher than the mean for "come," the result of the matched-pair signed ranks test was not significant ($Z=1.57$, $p < .05$). The direction of the differences was the same as that for the oral task, however, and with a more powerful statistical test, a significant difference might be found.

The results for motion verbs in overheard conversation in the oral task are similar to those found for pronouns in overheard conversation in the same task. In the case of referring pronouns (e.g. his, her), the child not only has to attend to who is speaking and who is being addressed, but also to who the third party in the discourse could be. In overheard conversation in the oral task, children made more errors on "his/her" ($\bar{X}=.71$) than on "my" ($\bar{X}=.08$). The difference between the mean ranks of the two pronouns was statistically significant ($Z = 2.52$, $p < .05$). Although the mean number of errors for "his/her" ($\bar{X}=.71$) was substantially higher than the mean for your ($\bar{X}=.25$), there was no statistical difference between the mean ranks. However, the direction of the differences suggests that children tend to make more errors when they have to adopt the perspective of the speaker. Identification of the speaker in a face to face situation does not require the adoption of a perspective other than one's own. However, in order to identify the addressee and the persons being talked about, the child must adopt the speaker's perspective and attend to the direction of his address. Correct identification of the referents of referring expressions (e.g. his, her) and correct identification of the goal location in the case of "go" also require attention to the third party in the situation as well as to the speaker and the addressee. In both cases, the child's task is cognitively more complex.

Although the interpretive strategies adopted by the children were similar across the oral and written tasks in the analogous conditions of overheard conversation and quoted dialogue, children nevertheless made significantly more errors in the written task. Moreover, the patterns of errors shifted. For example, in the written task, children tended to make as many errors on "my" ($\bar{X}$=.87) as on "his/her" ($\bar{X}$=.92). This suggests that in the written task, children were having more difficulty keeping track of the speech roles of the individuals portrayed in the text. In addition, they made relatively fewer errors on "your" ($\bar{X}$=.46). As noted, questioning revealed that several children envisioned the action as completed in the written task, as if the addressee had already gotten the penny. One would expect fewer errors on "your" if this were the case, since for "your," selection of the addressee would be a correct answer.

In the direct discourse condition, the results of the error analyses were quite different from those found in overheard conversation and quoted dialogue. Although no significant differences were found in the comparisons in direct address in the oral task, where very few errors occurred, significant differences were found between the mean ranks of "your" and "his/her" in the written task. Children made more errors on "your" than on "his/her" ($Z=3.180$, $p < .05$). In addition, there was a corresponding tendency for children to avoid selecting themselves as a referent when they made errors on the other pronouns. Questioning revealed that children often restructured the situation and claimed that the speaker was addressing the third party in the text. The results suggest that children find it difficult to imagine themselves as being the referent of "you" when they are addressed by unknown speakers in written text, and that they find it difficult to imagine themselves as part of the "world" of written text.

Picture Task

As in the oral and written tasks, results from the picture task indicated that certain deictic terms within particular categories were more difficult for children to contextualize than others. Significant differences were found between the mean ranks of "my" and "her" ($Z = 3.54$, $p < .05$), between "your" and "her" ($Z = 3.72$, $p < .05$) and between "your" and "his" ($Z = 3.34$, $p < .05$). Other pronoun comparisons were not significant. Children tended to make more errors on referring expressions (i.e., her, his) than on indexical pronouns (i.e., my, your) in the picture task. The results for this task are thus similar to those found in overheard conversation in the oral task.

Significant differences were not found in comparisons between the mean ranks of the locatives. In addition, percentages of different types of errors were evenly distributed between the two types of errors. The comments of the children suggest that those who made errors were attending to either the speech roles of the participants or to the meaning (proximal or distal) of the locative, but not to both. Children's responses to questions before they saw the pictures when errors were made suggested that they envisioned the text incorrectly.

Motion Verbs

Picture Set Type 1, Varying Direction of Motion with Participant Location and Direction of Address

The children in the group tested with this type of picture set ($n = 24$) made very few errors (5). The group means for errors on this type of picture set were .08 for "come," and .12 for "go," based on two repetitions of two items. Considering the low number of errors, it is not surprising that no significant difference between the mean ranks of errors for the two verbs was found ($Z = 0.405$, $p > .05$).

The low frequency of errors indicates that most of the children in this

group had little difficulty employing their knowledge of where participants must be located in space in order for motion verbs to be used appropriately in quoted statements where the reference time is the present, and further, that they understood the distinction between "come" and "go" as motion toward or away from the speaker.

Picture Set Type 2, Varying Direction of Address with Participant Location

The group means for errors on this type of picture set were $\bar{X}$ = .33 for "come," and $\bar{X}$ = .83 for "go," based on two repetitions of two items. A significant difference was found between the mean ranks of the two pronouns ($Z = 2.53$, $p < .05$). The children made more errors on "go" than on "come." Thus the results are similar to those found in the oral task where the motion verbs were also embedded in imperatives. The percentages of errors were identical for the two contexual variables. Thus children did not appear to find one of the variables more problematic than the other.

Picture Set Type 3, Varying Absolute Direction of Motion with Deictic Direction of Motion

The group means for this type of picture set were $\bar{X}$ = 1.04 for "come," and $\bar{X}$ = 1.08 for "go." No significant difference was found between the mean ranks of the two verbs ($Z = .109$, $p > .05$). However, the children appeared to have a great deal of trouble with this task. Questioning revealed that several of the children envisioned the action as completed, and they frequently failed to make any distinction between "came" and "went." The absolute direction of motion (e.g., up or down) appeared to be most salient. Children immediately rejected the picture in which the absolute direction of motion was wrong, but experienced difficulty in choosing between the pictures in which the characters were facing in opposite directions with respect to the camera but moving in the correct absolute direction. One hundred percent of the errors (51) were errors where the child selected the wrong deictic direction of

motion. Questioning also revealed that children often spontaneously envisioned the characters as facing in the direction opposite to that indicated by the verb.

### Measures of the Relationships of Children's Performance on the Written Tasks with Reading Achievement

In addition to the analyses described above, Pearson product-moment correlation coefficients were computed as measures of the relationships of children's performance on the written tasks of the study with two measures of reading achievement. Teacher ratings of students' reading performance were obtained from the five teachers who had children in their classes who participated in the study. Performance on the reading test of a standardized achievement series (SRA Achievement Series, Level C, Form 2, 1971) was also compared with performance on the written task.

Since task performance was based on number of errors, a negative correlation was expected. In general, performance on the written task was highly correlated with reading achievement as measured by the standardized test scores (TS) and as measured by teacher ratings (TR). Performance on pronouns in quoted discourse correlated with TS and the correlation was statistically significant ($r = -.44$, $p < .05$). Performance on pronouns in quoted dialogue also correlated with TR and the correlation was statistically significant ($r = -.55$, $p < .05$). In the direct discourse condition, similar results were found. Performance on pronouns in direct discourse correlated with TS ($r = -.45$, $p < .05$) and with TR ($r = -.61$, $p < .05$) and the correlations were statistically significant. Similar results were also found for locatives in quoted dialogue. Performance on locatives correlated with TS ($r = -.45$) and the correlation was statistically significant ($p < .05$). The correlation with TR ($r = -.34$) approached significance ($p > .05$). These correlations indicate that as reading achievement (as measured by the standardized reading test and

by teacher ratings) increased, errors on the written task decreased. In the case of the motion verbs, no correlations were found for either TS ($r = .07$, $p > .05$) or TR ($r = .15$, $p > .05$). However, the lack of correlations between performance on motion verbs and the reading achievement measures can be explained by a floor effect. Performance on motion verbs in the written task was uniformly poor.

## Discussion

The difficulty children had in interpreting the deictic terms investigated in this study appeared to result primarily from three factors: 1) the necessity of adopting the perspective of another, 2) the increased processing demands of tasks and discourse contexts which require simultaneous attention to multiple numbers of variables, and 3) the artificiality of particular kinds of written texts such as those which are given to beginning readers. The notion of cognitive complexity subsumes all three of these factors. Taking another person's perspective, attending to several variables at once, and dealing with artificial texts all contribute to cognitive complexity, i.e., they involve more complicated mental processes.

In this study, children clearly demonstrated their knowledge of the basic distinctions in the meaning of each of the deictic categories in certain tasks. In face-to-face conversation, when directly addresssed, children easily identified the referents of indexical and referring expressions, and they easily determined the distinction between proximal and distal uses of locative terms. They also demonstrated knowledge of the distinctions in meaning between the motion verbs. For example, in the picture task, when deictic direction of motion was portrayed in a photograph as motion toward or away from the speaker of a quoted sentence, they had no difficulty making the distinction between the two directions of motion indicated by the deictic verbs.

However, as mentioned, one factor which appeared to increase the cogni-

tive complexity of the task the children were asked to perform was taking someone else's perspective. For example, in the oral language task of the present study, children made significantly more errors when they were interpreting overheard conversation than when they were interpreting direct address. The notion that tasks which require children to adopt the perspective of another are more complex is supported by the results of supplemental post hoc analyses of the data. These analyses revealed that some of the terms within particular deictic categories were easier for children to interpret than others. The more difficult terms were those which required them to adopt someone else's perspective.

Although children found it difficult to interpret deictic terms in contexts which required them to adopt another person's perspective in the oral language task, that difficulty was minimal compared to the difficulty they had when they encountered the same terms in written texts. Like overheard conversation, written text requires that deictic terms be interpreted from the perspective of the "speaker" whether the speaker is the author of a text or a character engaged in dialogue with another. However, in addition to adopting the perspective of the speaker, contextualization of written texts requires the mental representation of imagined individuals in imagined situations for the purpose of adopting a perspective for text interpretation. Performance decreased significantly in written language tasks as compared to oral language tasks, for each of the deictic categories in the case of the analogous discourse contexts, overheard conversation and quoted dialogue, and for pronouns in direct address. In the comparisons made between overheard conversation and quoted dialogue, significant differences were found, even when the method for coding errors controlled for misinterpretations of the text based on misreadings of the punctuation.

The notion that children become less able to apply the knowledge they possess as processing demands increase is also supported by the results of comparisons between deictic categories. Motion verbs were more difficult for children to interpret in the oral and written tasks.

It is not necessary to assume, of course, that particular deictic categories are inherently more difficult for children to contextualize than others in all discourse contexts. For example, children had no difficulty interpreting motion verbs when they were incorporated in statements in the picture task and a single camera perspective on the situation was maintained. However, the results do suggest that some deictic categories are easier for children to interpret than others in particular task and sentence contexts.

Cognitive complexity may also depend upon aspects of the tasks children are being asked to perform. For example, in oral language situations, one would expect locatives to be more difficult because they are only implicitly anchored to the role of the speaker, and they require the child to adopt the speaker's perspective. However, this was not the case. Locatives were not significantly more difficult than pronouns in the oral language task. Although locatives may be more difficult to initially acquire because they are only implicitly anchored to the role of the speaker and their boundaries are indefinite, in situations where concrete referents are available, they may be no more difficult for children to contextualize than pronouns which refer explicitly to speech roles in the same sentence contexts.

The question cannot be entirely resolved because the oral task situation for the locatives necessarily differed from the task situation for the pronouns. The oral task for the locatives may have been easier than the task for the pronouns because there was only one contrast for the children to consider (e.g., this vs. that). For the pronouns there were three (i.e., my vs. your,

your vs. his, and my vs. his). The lack of significant differences between performance on the locatives and performance on the pronouns may thus have been an artifact of the task. However, in the written task, locatives were significantly more difficult than pronouns. In this task, children had the additional burden of having to remember who the relevant participants in the situation were. Questioning revealed that this was a problem encountered by some children.

Although the performance differences displayed by the children can largely be explained by task and situation specific processing load, they were not the only factors which affected children's performance. There is always the question of artificiality in experimental contexts which must be considered. For example, the differences in performance between the oral and written tasks might have been even greater if gesture or feedback had been allowed in the oral task. Gestures were not used in the oral language task of the present study, and children were required to interpret individual sentences without the support of feedback which would have clarified misunderstandings. In addition, although the children understood the nature of the "pretend" game they were being asked to play one would expect performance to be better in oral language situations where communication has a genuine real world purpose.

Artificiality of particular kinds of written texts was also a factor in the written language task. In this task, direct address texts were employed which required a special kind of artificial "pretend" contextualization. The written direct address texts used in this study required the children to pretend that they were being addressed by someone they didn't know. This aspect of the study simulated the kinds of things children are asked to do when they are given such texts to read in school and the situation doesn't tell them how to construe their task of interpreting the text. One would expect that chil-

dren would have less difficulty determining the referents of pronouns in messages with a genuine purpose written by someone they know.

Presumably, the motivation for using such texts in the first books of reading series is to foster involvement on the part of the students and to avoid using more complex structures which require anaphoric processes such as quoted dialogue. This strategy of basal text authors, which is intended to be helpful, may actually be ineffective. It may serve to complicate the task for students who find it difficult to pretend that they are being addressed by a fictitious individual from some fictitious world.

The findings of this study indicate that the ability to contextualize deictic terms is associated with reading achievement. The findings also indicate that children find the task of contextualizing deictic terms more difficult in written language contexts than in oral language situations. Because the encoding of the written message is separated in time and space from its decoding, deictic terms must be interpreted from the speaker's point of view in the context of the situation portrayed in a text in the case of quoted dialogue, or in the situation of which the text is itself a part in the case of direct address. In written texts, the problem of taking the perspective of another is compounded by the effects of separation in time and space, a pragmatic feature of written discourse. Because participants are not present, the child must be able to simultaneously remember who the participants are and adopt the perspective of the speaker for the purpose of anchoring the interpretation of deictic terms. The findings of this study indicate that many children may be unable to deal with this increased processing load at the time they begin learning to read.

The effects of increased processing load are particularly apparent when deictic terms are incorporated in quoted dialogue in written text. When reading quoted dialogue, children are required to coordinate deictic information

and recognize anaphoric relationships in the text as well. In the quoted dialogue texts employed in this study, only one individual took the role of speaker. One would expect that children would encounter even more difficulty in texts portraying a conversational exchange, where the role would shift from one individual to another. Such passages are frequently found in beginning reading texts. Although beginning reading series may employ "simple" common words in sentences which are not syntactically complex, the processes required for their contextualization may make the task of comprehension overly complex for many beginning readers.

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